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**OBITUARY**

# Irving Geis, Molecular artist, 1908–1997

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(Adapted from his funeral address, 25 July 1997)

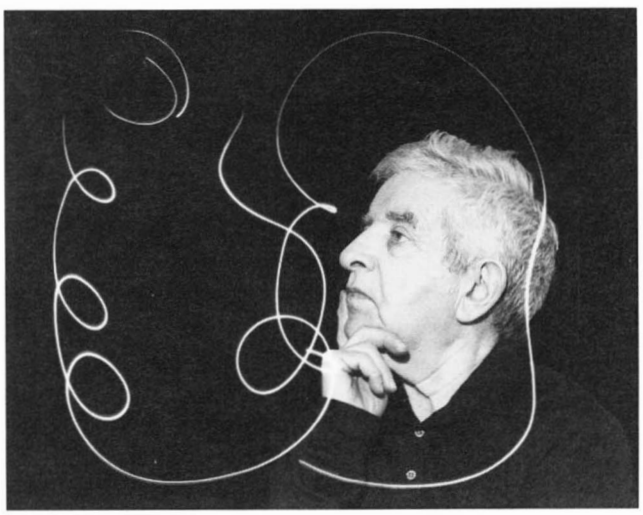
On 22 July 1997, the world lost one of the giants of scientific illustration and communication: Irving Geis of New York. He died at the age of 88 of a cerebral hemorrhage, attended by his wife Miriam and his daughter Sandra, a photographer with the *New York Times*.

This memoir is written to say a few words about Irving Geis as I knew him: as an artist, a scientific illustrator, and a human being. We first met in the summer of 1964, but it wasn't science that brought us together, it was art. On the last day of the International Congress of Biochemistry, a display went up in the New York Hilton of prints by John Held, Jr., recently reprinted from the original linoleum blocks. When I enquired about them, the concierge told me that the exhibit would not open until the following Monday, but that I could go up to 200th Street and talk to the man who had reprinted them; perhaps he would sell one.

So I wandered by subway to the very northern tip of Manhattan, and knocked on an apartment door. Irv Geis answered, and we discussed prints and John Held, Jr. I bought two prints from him, and then just as I was leaving, Irv noticed my lapel button from the Biochemical Congress and asked, "Are you a biochemist?" "Sort of," I replied. Irv volunteered, "I once illustrated an article for *Scientific American* on the protein myoglobin for a man from Cambridge named John Kendrew. Ever heard of him?" In astonishment I responded, "I certainly have. I was a postdoctoral with him on the myoglobin project in 1958–1959!" He pulled me into the apartment to show me the original painting of myoglobin, and a 33-year collaboration began.

The myoglobin painting of 1961 has been reproduced in countless places. Less well known but equally meritorious, and in the same style, is his 1966 painting of lysozyme, which illustrated an article by David Phillips, now Lord Phillips of Ellesmere. That painting graces the cover of this issue of *Protein Science*.

Irv and I wrote three books together: *The Structure and Action of Proteins* in 1969, *Chemistry, Matter and the Universe* in 1976, and *Hemoglobin: Structure, Function, Evolution & Pathology* in 1983. He became a co-author because I couldn't afford him as an illustrator. But even more than that, we developed a mutual symbiosis from which we both benefited. I could describe what needed to be illustrated about protein structure, and Irv would come up with clever and original graphic methods of putting the point across. It was never clear whether Irv illustrated my books, or I wrote Irv's captions. In the end, it didn't matter; together we could do more than either could have done alone. I have only lately come to appreciate the extent to which *Hemoglobin* was a masterpiece of typography and book design—clean, simple, attractive, yet informative. His drawings of hemoglobins under various conditions have never been matched. When you work closely with Irv, it is easy to become lulled into thinking that all artist/illustrator/designers are that good.



Portrait of Irving Geis, taken by his daughter Sandy. After the first exposure of the protrait, Sandy handed Irv a pen-light flashlight and told him, "Now draw a protein backbone in the air." The result is a portrait of Irv immersed in his work.

We and our families spent three memorable summers at the Benjamin writing center in Aspen, 1971–1973, working on a freshman chemistry textbook: *Chemistry, Matter & the Universe*. It was here that Irv revealed a marvelous sense of humor as a cartoonist, a talent that he had used earlier to illustrate Darrell Huff's *How to Lie with Statistics*. "That book showed the importance of a good image," Irv commented. "Huff could just have well entitled it *An Introduction to Statistics*, and it would have sold a few hundred copies for a year or two. But with that title [and with Irv's cartoons, I might add] it's been selling steadily since 1954." My children were then in junior high school and grade school, and Irv became unofficial grandfather-in-residence to them all. My oldest boy worked as a go-fer and general handyman/assistant for Irv one summer, and was star-struck with the idea that he was helping a real artist! Irv's daughter Sandy was grown up and on her own, but she came to visit Irv and Miriam in the Colorado mountains.

Irv loved the west, and his brother lived in Southern California. "Why don't you and Miriam simply move out here?" I asked. "There are two reasons why not," he replied. "For one thing, everything I need as an artist and illustrator is close at hand in Manhattan; I couldn't duplicate that in any other city in America. And the second reason is Miriam. She wouldn't be happy out west; she thinks that civilization stops at the Hudson River." "So do I, Irv," I replied. "So do I."

Being around Irv, I absorbed homilies about art that are hard to forget. He once commented that his job was not to draw a protein exactly as it was, but to show how it worked. A computer could draw a protein, given the right set of coordinates. But who would tell it exactly what to show? If some key aspect of protein structure was eclipsed and out of sight, the computer would be stuck. But Irv the artist could just tweak it a bit, and move it out in the open where it could be seen and the molecular mechanism thereby understood. He called this process "selective lying," and claimed that this was one of the special talents of a knowledgeable artist. "Knowledgeable" was the key. Most artists have no idea what they are drawing, he commented. He was once making an elaborate illustration of a folded protein, surrounded by space-filling $H_2O$ molecules. A fellow artist watched him for a bit, and then remarked that Irv need to "put a few more lima beans over on the left."

Another of Irv's aphorisms is unforgettable. He had no use for artists who splash brilliant but arbitrary colors over their work to impress the casual viewer. "Color is a language," he said, "and as with any other language, one mustn't babble!" With the advent of widespread and easy-to-use computer graphics, and new scientific journals that fall all over one another in competition for four-color flash, it seems to me that a lot of babbling is going on today, of a sort that Irv would not have approved.

Irv was very taken with the importance of using art to put across scientific concepts. On more than one occasion, he likened himself to Andreas Vesalius, whose informative and artistic engravings taught the Renaissance public about the new field of human anatomy. Irv thought of his own role as that of a molecular Vesalius, using art to teach the modern public about the equally new field of molecular anatomy. But in view of his many-faceted talents, as artist, illustrator, interpreter, and scientific lecturer (an achievement of which he was very proud in his later years), it is more fitting to say that Irving Geis was the Leonardo da Vinci of protein structure.

*A few biographical facts about Irving Geis*

Born 18 October 1908 in New York City.
High school Valedictorian in Anderson, South Carolina.
1925–1927: Studied architecture at Georgia Tech.
1927–1929: Bachelor of Fine Arts, University of Pennsylvania.
1932–1933: Studied design and painting, University of South Carolina. Graduated in the depths of the Depression, when jobs for architects were few.
1934–1940: Free-lance illustrator in New York, including *Fortune* Magazine.
Married Miriam Artman, December 1936. One child, Sandra.
1941–1943: Chief of the Graphics Section of the Office of Strategic Services, Washington DC. (The OSS was the predecessor of the CIA.)
1944: Art Director, domestic branch of the Office of War Information, New York.
1948–1983: Regular illustrator for *Scientific American*, specializing in astronomy, astrophysics, geophysics, chemistry, and biochemistry.
1963–1997: Co-author and/or illustrator of major books in biochemistry and molecular biology, including the three with Dickerson, plus Klainer and Geis, *Agents of Bacterial Disease* (1973), and *Biochemistry* textbooks with Zubay (1983), Mathews & Van Holde (1990), Voet and Voet (1990), Campbell (1991), and Garrett and Grisham (1994).

*Exhibits of molecular art*

1979: Boston: Ciba/Geigy microbiology exhibit.
1982: Las Vegas: American Chemical Society.
1983: Albany, New York: State University of New York.
1984: Los Angeles: Molecular Biology Institute, UCLA.
1986: San Francisco: Biophysical Society.
1988: Philadelphia: Moore College of Art. "The Art of Crystallography."
1989: Philadelphia: Beckman Center for the History of Chemistry. "The Structure of Life."
1989: Bethesda, Maryland: NIH Clinical Center Galleries. "Design of Life—The Molecular Art of Irving Geis."
1993: Boston: Massachusetts Institute of Technology.

One of Irv's fondest hopes was that his massive collection of paintings, drawings, models, sketches, writings, and correspondence with scientists could be preserved in one place as the Geis Archives, for study by future students and molecular biologists. The Guggenheim Foundation awarded him a grant in 1987–1988 to begin the process of organization, and he was engrossed in planning and cataloguing the Archives until his death. It would be highly appropriate if a permanent home could be found for the Geis Archives, for they are, indeed, his life's work.